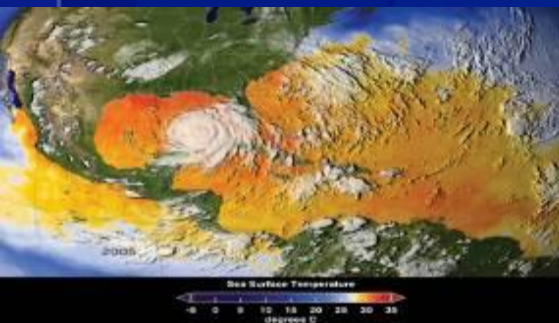


CDC Climate-Ready States & Cities Initiative



Regional Climate Scenarios – Climate Projections

*Maryland Climate Change Project Meeting
College Park, College Park
June 28, 2013*

Presenters

**Steven Davis - CDC, Climate and Health Program
Public Health Advisor**

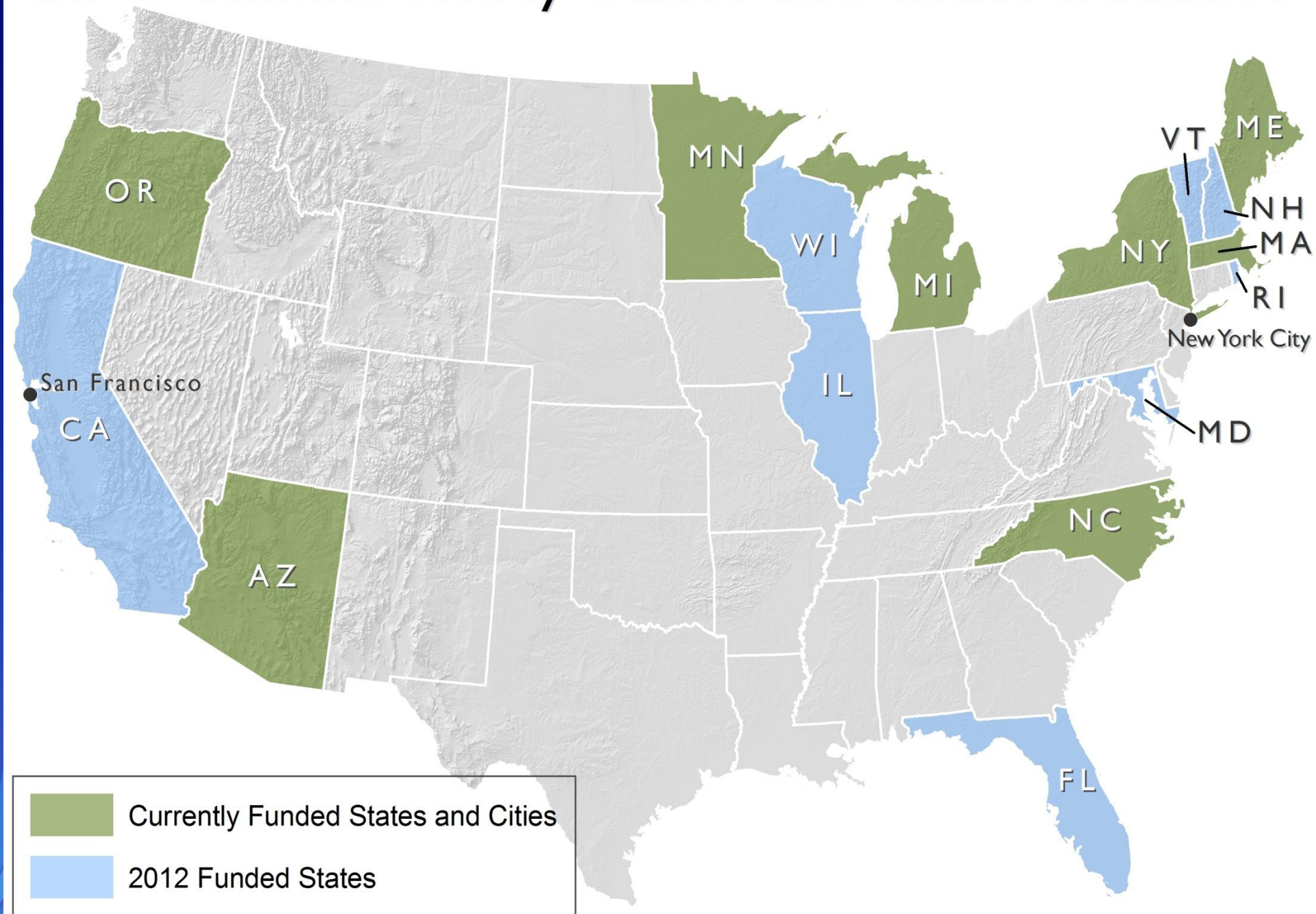
**Paul Schramm – CDC, Climate and Health Program
Health Scientist**

**Chris Uejio – CDC Research Applications Laboratory National
Center for Atmospheric Research**

CDC's Climate & Health Program

- **CDC Climate Change Framework established in 2006**
 - Formally constituted as a Program in March 2009 with congressional appropriation (Climate and Health Program)
- **The mission of CDC's Climate and Health Program**
 - Lead efforts to identify vulnerable populations to climate change
 - Prevent and adapt to current and anticipated health impacts
 - Assure that systems are in place to detect and respond to current and emerging health threats
- **The program has 3 core functions:**
 - To translate climate change science to inform states, local health departments and communities;
 - To create decision support tools to build capacity to prepare for climate change; and
 - To serve as a credible leader in planning for the public health impacts of climate change

CDC Climate Ready States and Cities Initiative



1. Forecasting
Climate Impacts
and Assessing
Vulnerabilities

2. Projecting the
Disease Burden

3. Assessing
Public Health
Interventions

4. Developing and
Implementing a
Climate and Health
Adaptation Plan

5. Evaluating
Impact and
Improving Quality of
Activities

BRACE

Climate and Health Program, National Center for Environmental Health



Scenarios for Climate Assessment and Adaptation

[Home](#)[Scenarios](#)[Images](#)[Regions](#)

Announcements

Scenarios Web Resource Released!

Jan 9th 2013 -- A suite of scenarios of climate, sea level rise, land use and land cover, and other conditions are now...

[more »](#)

Additional Resources

- [Subscribe to Updates](#)
- [Provide Comments and Feedback](#)
- [National Climate Assessment](#)
- [United States Global Change Research Program](#)

On these pages you will find information about and access to a suite of climate and other scenarios produced as input to the U.S. National Climate Assessment. There are documents, graphics, references to data sets, and other resources that have been prepared to depict a range of plausible future conditions against which risks, vulnerability, and opportunities can be assessed at regional and national scale. In addition to providing input to the National Climate Assessment, these scenarios are designed to be useful to a variety of other users including researchers, technical report teams, and decision makers. Over the next several years, we expect to evolve the scenarios to keep them up to date and make them as user friendly as possible, in support of the ongoing assessment process.

Please use the tabs at the top of the page to navigate to these documents and resources.

The National Climate Assessment

The [National Climate Assessment \(NCA\)](#) is being conducted under the authority of the Global Change Research Act (GCRA) of 1990. The GCRA requires a report to the President and the Congress every four years that integrates, evaluates, and interprets the findings of the U.S. Global Change Research Program (USGCRP). The Act requires assessment of the effects of global change (both human-induced and natural) on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity. The time periods for analysis include current conditions as well as projections of major trends for the subsequent 25 to 100 years.



U.S. Global Change Research Program

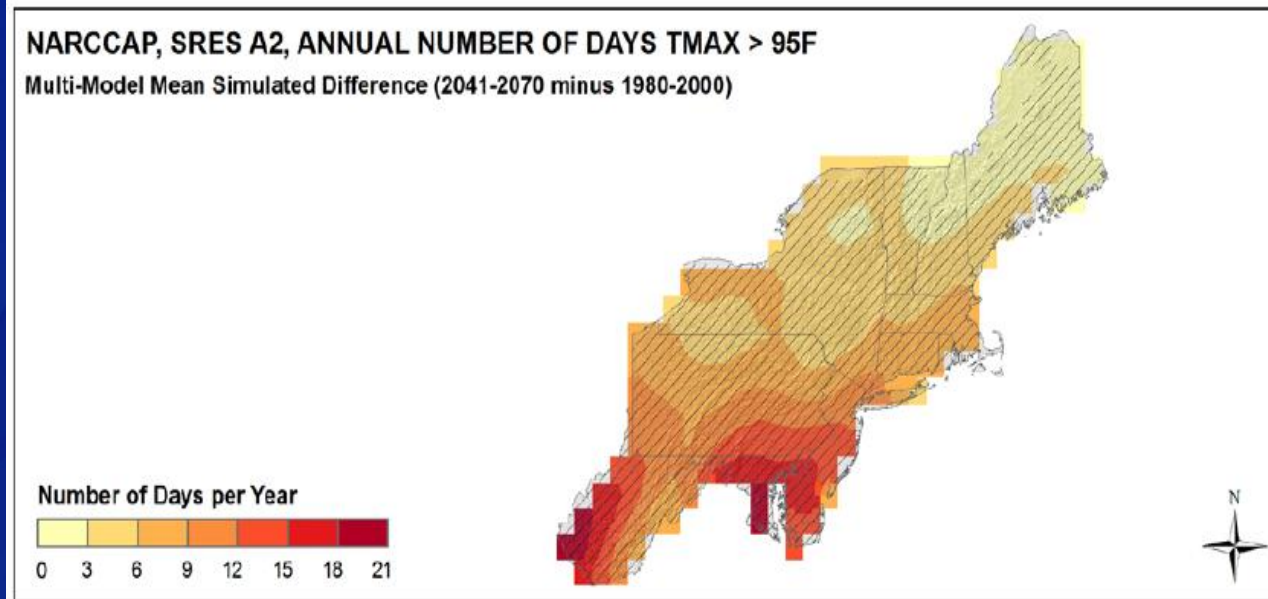
National Climate Assessment

National climate assessments provide status reports about climate change science and impacts. They are based on observations collected across the country as well as research that uses projections from climate system and other models. The NCA incorporates advances in the understanding of climate science into larger social, ecological, and policy systems, and provides integrated analyses of impacts and vulnerability.

The NCA integrates scientific information from multiple sources and highlights key findings and significant gaps in our knowledge. It also helps the federal government prioritize climate research investments that will provide science for use by communities around the country to plan more sustainably for our future.

NOAA technical reports in support of the National Climate Assessment (NCA)

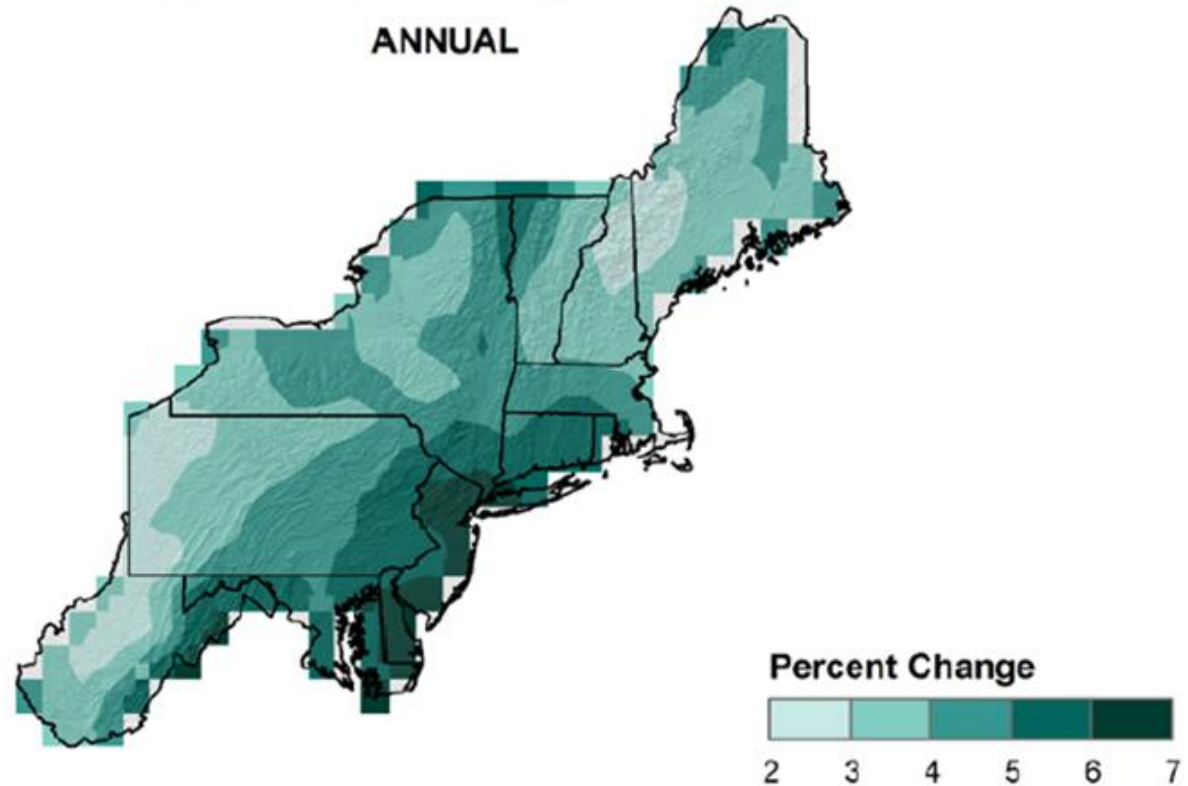
- Developed by Kenneth Kunkel, North Carolina State University and NOAA's National Climatic Data Center (NCDC)
- Ten reports: the entire USA, each of the eight NCA regions, and a national sea-level rise scenario
- Regional climate trends and scenarios using CMIP3; useful for projecting future climate-related disease burden



NARCCAP, SRES A2, PRECIPITATION CHANGE

Multi-Model Mean Simulated Difference - (2041-2070 minus 1971-2000)

ANNUAL



Projected percentage increase in annual precipitation in the Northeast

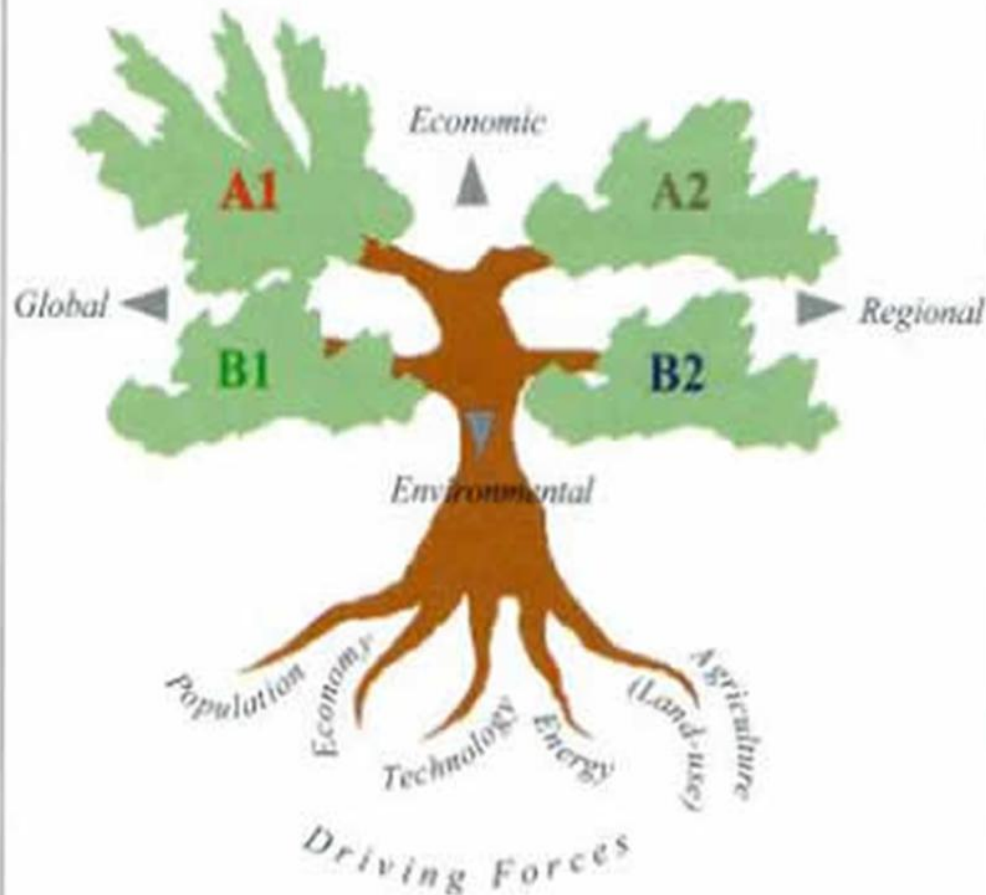
Climate Models

- ❑ Climate projections: plausible future conditions
- ❑ Transfer energy, moisture, & mass follow laws of physics
- ❑ Constantly improving
- ❑ If weather model \neq one weather station
Station is usually malfunctioning

Key Climate Projection Concepts

- ❑ **Scenarios: Plausible future trajectories of greenhouse gas emissions**
- ❑ **Downscaling: Local, relevant projections**
- ❑ **Ensemble: Multiple models or model runs that express uncertainty surrounding climate projections**

SRES Scenarios



Rapid Growth-A1

population ↑

economic ↑

Regional Growth-A2

population ↑

economic ↑

Service Economy-B1

population ↑

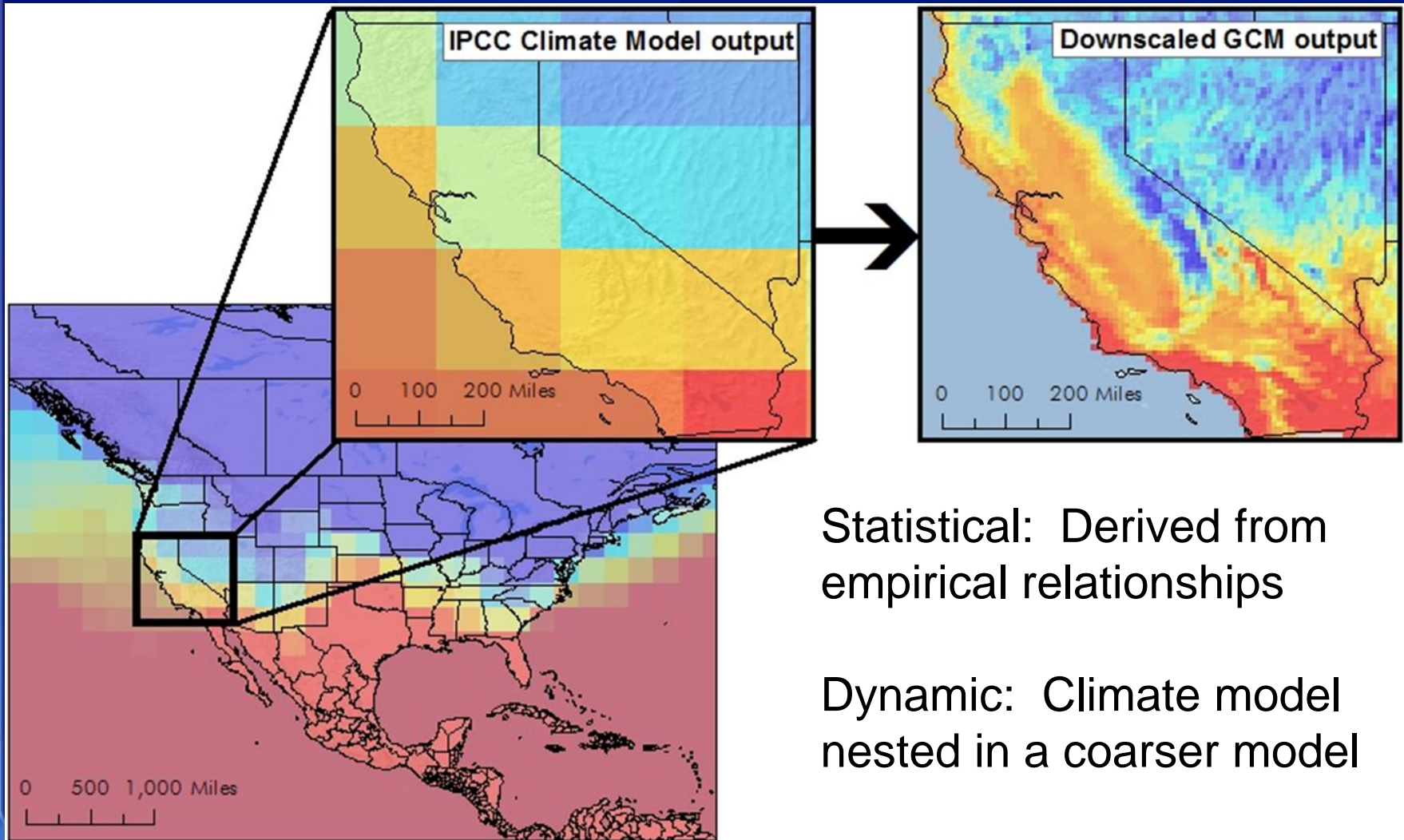
economic ↑

Local Solution-B2

population ↑

Economic ↑

Downscaling



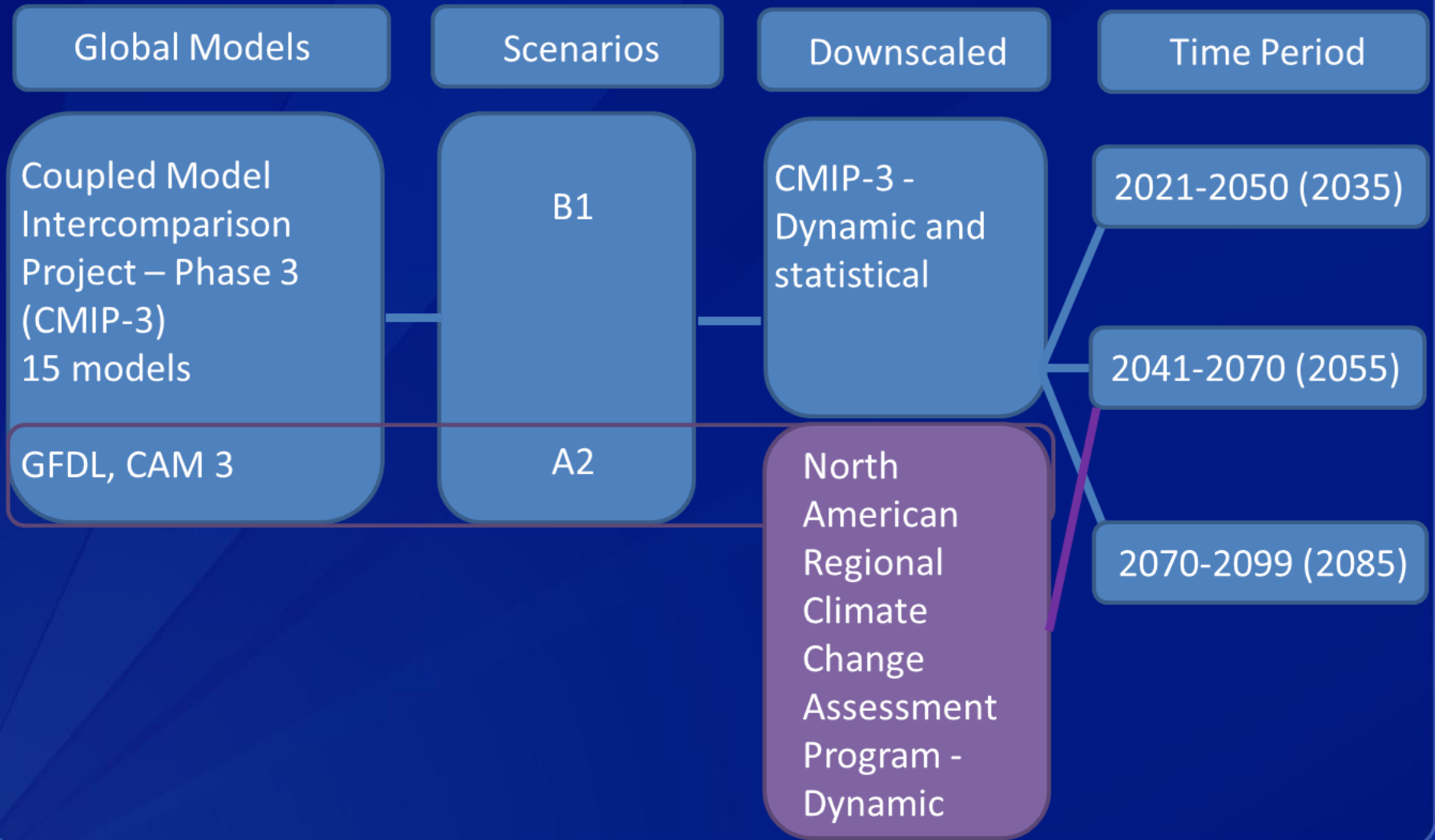
Statistical: Derived from empirical relationships

Dynamic: Climate model nested in a coarser model

Downscaling II

	Statistical	Dynamical
Advantage	Computationally Efficient	Represent Physical Processes
	Easy to Implement (e.g. Regression)	Capture Feedbacks
	Directly Incorporate Observations	May Capture Extreme Events
Disadvantage	Requires Long Term Observations	Computationally Intensive
	No Feedbacks	Fewer Scenarios

Climate Projections, National Climate Assessment



Hurricane Irene

5 PM EDT Wed Aug 24 2011
Models: Points 6 hours apart
Initialized on Wed 2:00 PM EDT
GFS
Ensemble Members

Multi-model Ensemble

